CERT COMMENTS ON RECLAMATION PLAN

JACKPILE-PAGUATE URANIUM MINE

ANACONDA MINERALS COMPANY

MARCH 1982

1.0 INTRODUCTION

1.1 Purpose and Requirements

- Specifics on the reclaimed 485 acres should be presented, including range survey data, radiological attenuation, etc.
- The plan indicates Anaconda's use of experts and consultants; are reports on the work of these consultants available?
- The potential impacts of open pit backfilling of hazardous wastes on the groundwater and the subsequent impacts on the surface waters are not addressed.
- Some statements made in the text are general and lack supporting data and technical analysis. Some or much of the needed information is probably available, but was not incorporated into the proposed reclamation plan.
- The 485 acres reclaimed to date when visually assessed ranged from poor to excellent. Has Anaconda determined what factors contributed to these diverse results?

1.2 Content of the Reclamation Plan

- Plate 6.1-1 measurements of backfill and dumps do not in all cases correspond with the cross-section plates.

2.0 RECLAMATION OBJECTIVES

2.1 General

- Although it is accepted that reclamation will mitigate, enhance, and protect the environment, the proposed activities associated with the reclamation effort could cause some environmental impacts. Therefore, it is recommended that one of the objectives of the reclamation plan be "to minimize impacts associated with reclamation."
- A brief subsection needs to be developed in this section which addresses the general issues related to quantifying the environmental emissions associated with the reclamation of the area and developing procedures to minimize any reclamation impacts to air, water, and land.

2.2 Mitigate Effects on Disturbed Lands

- The reclaimed areas that were evaluated were claimed to approximate that of the surrounding undisturbed rangeland. Anaconda should provide a summary of revegetation results on the older reclaimed area.

- Tribal members have indicated that prior to mining, the areas along the Rio Paguate were farmed once. Anaconda should respond to this.

- No evidence is presented to substantiate the premise by Anaconda that over an unspecified time period the evaluation of revegetation efforts have shown that an older reclaimed area plant species diversity, cover, and forage production approximate that on surrounding undisturbed rangeland.

2.3 Mitigate Safety and Health Hazards

- The discussion on slopes should be expanded to include how dump slopes will be selected for the proposed modification.

- Supporting data with respect to pit wall stability evaluations should be referenced and a summary of findings included.

- The procedures used to identify potential radiological hazards should be discussed, the criteria followed in disposing of the hazardous waste, and the potential impact on ground and surface water should be discussed.

- The fencing of portions of the pit wall crest in the vicinity of the Paguate Village is not adequate. Methods to eliminate this safety hazard, as committed to in basic reclamation objective (2) should be presented.

- The static and dynamic (seismic loading) criteria that will be used to assure safe, stable repose of the dump slopes was not presented.

2.4 Protect the Environment

- Discuss how the groundwater recovery level was determined.

- The relationship between pit backfilling to three feet above the project water table recovery water level and protection of the groundwater quality is not discussed. Material returned to the pits, which will include the mineralized Jackpile sandstone, would seem to initially result in greater opportunity for dissolution of material into the groundwater system resulting in degraded groundwater quality. Since groundwater provides base flow to area surface streams, the surface water quality would also be degraded. Projected changes in groundwater and surface water quality as a result of reclamation should be discussed in the reclamation plan.

- Since ambient air quality standards for Total Suspended Particulates (TSP) may be violated in the area, the actions of establishing vegetation grown for the reduction of wind-blown particulates will enhance the air quality environment, not necessarily protect it. A more proper title for this subsection may be "Enhance the Environment."

- The air quality and water quality monitoring programs were not presented and discussed in sufficient detail to demonstrate the capabilities of these programs to assess the effectiveness of the proposed reclamation plan to protect the environment over the long term.

- The control of water movement by the erosion berms should be presented in greater detail. How will this water be managed; where will it go?

- The groundwater protection afforded by backfilled pits should be discussed.

- What will the baseline or comparison criterial for the assessment of air and water quality data with respect to the effects of reclamation? What, if any, action will be taken if the data indicates problems with the reclamation?

- What is the groundwater recovery level in relation to the riverbed of the Rio Paguate?

4.0 EXISTING CONDITIONS

4.1 Ground Disturbance

- The statement "Environmental sampling and visual observation have shown no significant adverse effects to date upon the environment outside the boundaries of the mine . . ." is not supported by data or reference. This statement should be substantiated.

4.2.1 Surface Water

- Data on flow and water quality should be provided to support the statements of flow variability and reported quality levels.

- Data should be included to support the statement that "degradation of water quality through the mine area results primarily from concentration by evapotranspiration." In the Mining and Reclamation Plan, The Anaconda Company's Uranium Mine, December 1976 (revised March 1979), it is indicated that groundwater discharge is probably the principal cause of increased uranium concentrations observed along both streams.

- What was the period of base flow collection and when was the data collected with respect to mining activities?

- The impact of the mine on surface water quantity and quality should be discussed.

- The water quality (analysis of the chemical constituents) and flow rates for the Rio Paguate and Rio Moquino are presented in very general terms. More detailed data are necessary to characterize these parameters over the various seasons of the year. The monitoring program should be designed to provide this information on a continuing basis over the long term.

- Data supporting the statement that the mine has had no impact on Mesita Reservoir should be presented and report findings summarized.

4.2.2 Groundwater

- What are the possibilities that contaminated groundwater from fractured aquifers may seep into surrounding good quality aquifers?

- Anaconda contends that the effect of mining upon groundwater extends only limited distances from the active mining areas due to the hydrologic properties of the Jackpile sandstone. These properties should be discussed in more detail to substantiate their hypothesis.

- The relationship between the disposal of hazardous waste and groundwater levels and fluctuations should be discussed. Potential water-related impacts in conjunction with the hazardous waste disposal should be discussed.

4.2.3 Air Quality; Particulate

- The statements associated with this subsection are not supported by data or by reference. These statements should be substantiated.

- A full discussion of the results of past ambient air quality and meteorology monitoring was not made. An important aspect of any air quality impact analysis is the description of baseline conditions.

4.2.4 Radiology

- The document(s) containing information on radiation background studies should be presented.

5.0 RECLAMATION AND ENVIRONMENTAL BACKGROUND

5.1 Previous Reclamation Plans

- Reclamation progress reports should be made available.

5.2 Environmental Studies Conducted

- Criteria used to determine the need for continuation of environmental monitoring programs should be discussed and the individual responsible for making that decision should be identified.

- A more detailed discussion of the monitoring programs should be presented and collected data summarized.

- Specific references for the studies and programs undertaken by consultants and government agencies should be provided.

- The measurement techniques, sampling frequencies, equipment specifications, and criteria for the selection of monitoring sites for the five surface water and four groundwater locations shown in Plate 6.2-2 are not discussed.

- The criteria for selection of the locations of additional groundwater monitoring wells being drilled were not presented.

- Neither the evaluation procedure nor the criteria for measurement of the success or failure of the revegetation program are discussed.

- Although a list of studies performed by various consultants and governmental agencies for Anaconda that are germane to the development of the reclamation plan is presented, none of these studies is discussed in detail and/or attached to the subject reclamation plan as an appendix—which is a normally acceptable format.

- The meteorological and particulate monitoring program correctly addresses the proper parameters to be measured. However, certain issues relating to operation of these stations are not specified in the document. The following comments are made to resolve these issues.

  - The use of the existing monitoring sites for future meteorological and particulate data collection needs further discussion. Of particular interest would be the criteria used in siting. A determination that federally accepted monitoring site criteria were followed should be made.

  - The air particulate sampling discussion references a monitoring schedule and frequency of measurement which is inconsistent with federal monitoring guidelines. It is recommended that TSP samples be taken on a 24-hour continuous basis at least once every six days to be consistent with the federal guidelines. Further, the schedule used by the state of New Mexico at the Paguate Hi-Volume Sampler is recommended.

  - In order for the meteorological and TSP monitoring program to produce useful information to the Laguna Pueblo, if it has not been done already, a monitoring plan with a quality assurance component should be developed and submitted to the U.S. Environmental Protection Agency (USEPA) for concurrence.

  - Related to the development of such a monitoring plan, proper data analysis and reporting procedures should be identified inthis docuement. It is recommeded that data be analyzed according to standard federal requirements and reported quarterly to the Laguna Pueblo. In this analysis a comparison of the results of the state of New Mexico's Hi-Volume sampler at Paguate should be made. Also, in order to judge the adequacy of the monitoring program, audits and data collection efficiencies (recovery rates) should be specified.

  - Criteria should be developed in the document to assess the effectiveness of any air pollution mitigation techniques used.

- Range survey discussion documents and data should be made available.
- The studies mentioned on page 25 should be provided.

6.0 RECLAMATION PROCEDURES

6.1.1 General

- It is not clear that the exposed Jackpile sandstone on pit walls does not constitute a radiological hazard. It this based upon the recommended use of the area for grazing or monitoring? Can this be clarified?
- Will the backfilled pits to three feet above the project groundwater recovery level also be topped with five feet of cover? The actual backfill and cover procedures should be discussed. It is indicated that following removal of the railroad spur and select surface structures the area will be stripped or covered until gamma levels are below twice background in adjacent areas. How are adjacent areas defined and selected? It appears that particularly along haul roads and the rail line, the adjacent areas would likely be contaminated by fugitive dust, and thus not represent a true background for the area. If the gamma survey control grid areas, as shown in Plate 5.2-1, are used as a representative background it should be stated and discussed.
- The question of what is representative of natural radon and gamma background levels for the area with respect to the permanent structures that are to remain should be discussed and summarized in the reclamation plan.
- The identification and management of hazardous waste should be discussed in detail and potential environmental impacts identified.
- The basis for radioactivity levels and the specific levels that the roads and shop areas will be cleaned to is never discussed.
- What are the proposed procedures for closing audits and vent holes?

6.1.2 Pits

- Describe the amount of backfill determination methodology. Describe the extent of radiological mineralization of the pit floor and up the pit walls, and the levels factually determined to require backfill.
- What soil analysis limitations are suitable for plant growth medium?
- If and when vegetative cover is adequate to support grazing, will there be any monitoring program to determine whether or not any toxic elements are accumulating in the vegetation?

6.1.3.1 Dump Reclamation Completed or Planned

- Define hazardous material to be removed and describe where this material will be placed.

- The Jackpile sandstone waste dumps should be identified in the text.
- Have any of these dumps been extensively sampled and their representative chemical compositions determined? If so, the results of these analyses should have been presented.
- Radiological levels following a presently reclaimed waste dump should be presented and the relationship between those levels and levels anticipated for the areas to be reclaimed should be discussed.
- Describe in detail the successes of reclaimed areas and document data supporting why no futher action is planned.

6.1.4 Protore and Jackpile Sandstone Waste Piles

- To what radiological level will the land under the stockpiles be reduced after the piles are removed?
- How will the gamma radiation background levels be established, since it is indicated that these levels will be one of the criteria for the stockpiles, protore, and ore-associated waste piles reclamation?
- What are the uranium values contained in the protore and ore-associated piles, and what will be the potential impact of relocating these piles to the pit?
- Define background gamma radiation levels.
- Describe method to be used in revegetating the areas under protore and associated ore-piles.

6.1.5 Drill Holes

- Have important aquifer systems been intercepted by the drill holes? Has aquifer interconnection occurred and if so what is the impact?
- Is surface plugging of drill holes adequate to ensure no environmental impact?
- To what extent will plugging be done—total depth or surface only?
- Describe in detail how drill hole sites and the roads to drill sites will be reclaimed.
- Since over 20,000 development and drill holes have been drilled on the Jackpile-Paguate mining leases, how can one be certain that all these holes will be plugged unless inventories have been recorded and maintained over the 17-year operating period? A detailed discussion of this potential problem area is needed.

6.1.6 Surface Structures

- Define what is meant by "free of radiological hazards."

- The criteria and level used to determine "unsafe radiation levels" should be presented and discussed.

- Describe how portions of structures that are nonsalvageable will be disposed of in the pit.

6.1.7 Surface Waterways

- Sedimentation analysis is necessary to define that contamination attributable to Anaconda operations. It is also necessary to establish the condition of the reservoir to proposed water use. The definition of Anaconda's contribution can be identified via ratio analyses techniques. Water analysis should accompany the sedimentation analysis, especially during the spring runoff season when the sediment would be disturbed.

- Concerns pertaining to sedimentation and radiological contamination of the Mesita Reservoir should be resolved by a detailed sedimentation analysis to determine the proportion of contamination that is due to the Anaconda mining activities since 1953. Complementary sedimentation and water analyses are needed to determine the probable degree of contamination.

- Data on the "detailed radiological assessment of Mesita Reservoir" should be summarized in the reclamation plan.

6.1.8 Groundwater

- The anticipated groundwater quality in the area and the influence on the water quality in the Rio Paguate and Rio Moquino should be discussed.

- What criteria was used to determine the "suitable distance from the stream" for dumps along the Rio Paguate and Rio Moquino?

- Since Anaconda proposes to excavate the dumps placed along the Rio Paguate and Rio Moquino a distance of 200 feet from the streambeds, how will these mounds be stabilized to prevent subsequent movement from wind and water erosion over the long term?

6.1.9 Revegetation Methods

- Identify the SCS literature relating to the erosion control measures mentioned.

- The revegetation activities and equipment described are similar to those employed in typical reclamation operations.

- Follow-up program described is an excellent gesture to ensure that eventual outcome of the revegetation effort is adequate.

- Revegetation research programs should be documented and made available.

- Studies related to off-site areas should be made available.

- What criteria were used to compile the two seeding mixtures?

- Care should be taken in use of yellow sweetclover, crested wheatgrass, western wheatgrass, and weeping lovegrass in the seeding mix. They may dominate the other plants during establishment. Moreover, they may attract livestock to the area because they are the more palatable species.

- Fencing revegetated areas will control livestock invasion during the critical early establishment period.